

## ABSTRACT

In order to detect high-speed transients in the alternating current of a power distribution system, the rate at which the power on the distribution system is sampled is increased so that even high-speed transients are detected. The sampling rate can be increased in at least two ways. First, where a single analog-to-digital converter samples multiple lines through a multiplexer, the multiplexer is controlled to allow the converter to sample only one line at a much-increased rate. Alternatively, the sampling speed of the analog-to-digital converter (or A/D array) can be controlled and increased as needed.